

Doomed to isolation or just exploiting spatial benefits? Notes on the strange distribution of the Galapagos shark (*Carcharhinus galapagensis* Snodgrass & Heller, 1905)

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Introduction

The Galapagos shark (*Carcharhinus galapagensis*) is a large carcharhinid shark that is mostly known around oceanic islands of the tropical, subtropical, and warm-temperate regions of the world, where it can be the most abundant of local sharks. This circumglobal distributed shark exhibits a wide geographic range throughout the Atlantic, Indian, and Pacific Oceans. *Carcharhinus galapagensis* shows a striking disjunct distribution and a strong affinity to remote and isolated oceanic islands, archipelagos, atolls, and seamounts, mostly at a great distance to continental coasts. Its distribution includes some of the most remote island ecosystems of the world. Thus, this special spotty shape of its geographic range, which comprises widely separated populations, is noticeable. Currently, this unusual distributional pattern, probably the most distinctive of all carcharhinid sharks, is only poorly understood. Hence, it requires a plausible explanation and makes this species a subject for biogeography as well as spatial investigations that target phylogeography, movements, habitat connectivity, and gene flow. The purpose of this present study is to provide a comprehensive list of the global records and reports of this species for building a reliable distribution map that can be a base for further spatial planning and analysis.

Methods

The author conducted an extensive review of the available literature that included distributional data of *C. galapagensis* under consideration of non-English references. Moreover, this investigation included also voucher specimens that are housed in ichthyological collections. This data were used to create a reliable and updated distribution map that displays the current state of knowledge of global Galapagos shark occurrences. Moreover, the analysis included also a distribution of age classes of *C. galapagensis*.

Results

The review of published literature revealed only 69 verified records worldwide, consisting of 53 occurrences around oceanic islands and only 16 at continental coasts (GAUSMANN 2025). For the latter, only adults and subadults have been reported, which are assessed as roamers, and small juvenile specimens occur exclusively around oceanic islands, leading to the conclusion that insular habitats are very likely nurseries for this shark. For Europe, there are only 4 records of *C. galapagensis* from oceanic island habitats (Fig. 2). Thus, *C. galapagensis* can be considered a rare species from a global perspective that is mainly restricted to oceanic islands across the globe.



Figure 2: Global distribution of *Carcharhinus galapagensis* in the Atlantic, Indian, and Pacific Ocean showing confirmed (blue) and unconfirmed (yellow) records (GAUSMANN 2025)

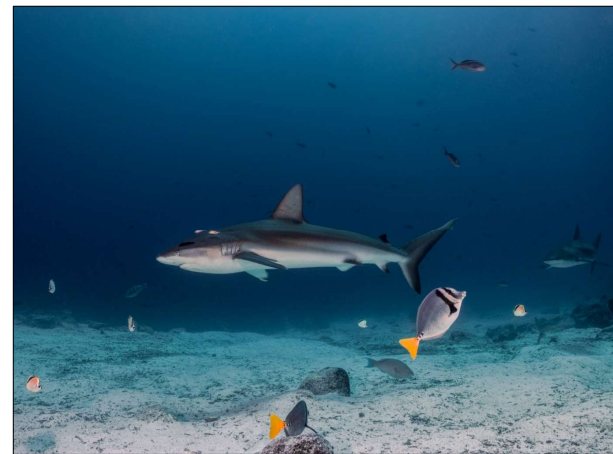


Figure 1: Adult female of *Carcharhinus galapagensis* around the Galápagos Archipelago. This large-bodied (~3.70 m TL) shark exhibits a very unusual distribution pattern which is only poorly understood, with occurrences mainly at oceanic islands. © Louis David

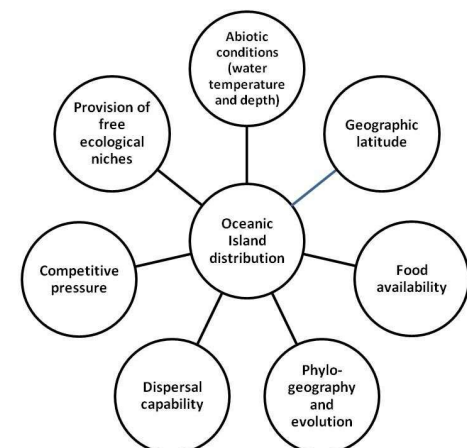


Figure 3: Biotic and abiotic factors that may influence the distribution of the insular *Carcharhinus galapagensis* (Gausmann 2025)

Discussion

The factors that may have shaped the unusual distribution pattern of *C. galapagensis* are complex (Fig. 3). However, because the presence of the small juvenile age class is exclusively restricted to oceanic islands, the latter may function as nurseries for this species. This can be understood as a type of reproductive behavior, which has been also observed in other *Carcharhinus* species, e.g., *Carcharhinus leucas* Valenciennes, 1839, whose offspring leaves the marine environment to reduce predation risk. The advantage of the distribution of juveniles around remote oceanic islands is assumed in the low competitive pressure and the largely absence of coastal predators from continental coasts (e.g., *C. leucas*, *Galeocerdo cuvier* Péron & Lesueur, 1822, and *Sphyrna mokarran* Rüppell, 1837. Despite its current assessment with „Least Concern“ by the IUCN on a global scale (KYNE et al. 2019) and a few populations of this shark protected by Marine Protected Areas (MPAs) such as around the Kermadec Islands, the Galápagos Archipelago, and Ascension Island, many of the populations are unprotected, making them vulnerable to strong fishing pressure and depletion. In the past, there is evidence for a near-extirpation of the Galapagos shark at Saint Peter and Saint Paul Archipelago (Brazil) resulting from overexploitation. Although some studies targeting this species are available for the Tropical East Pacific (TEP), nearly nothing is known about the migration behavior, status of stocks, and population connectivity of *C. galapagensis* in the Atlantic and Indian Oceans.

References

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